

## LIFE HISTORIES OF NORTH AMERICAN GEOMETRIDAE.—X.

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*Therina pullucidaria* G. & R. A moth was submitted to Dr. Hulst for determination. The larva is previously undescribed, though the pupa has been described by Dr. Packard (5th rept. U. S. ent. comm., 777, as *seminudaria*). In the following there is a small chance for error. The eggs and stage I were obtained from a moth of *pullucidaria*, but the larvae would not feed. (They were not given pine, as I did not know their food plant at the time.) The rest of the life history is from larvae collected on pine, but not bred. However, I have a moth bred from pine by Dr. Packard, establishing the food plant.

*Egg* Roundly elliptical, flattened above and below, a little wedge shaped from side view, perfectly rounded; one end truncate, the truncate part bulging in its center. Neatly reticulate, the cell areas flattened. Pale green, somewhat grayish, shining. Size  $.8 \times 6 \times 5$  mm. Laid singly in captivity. Eggs found in nature were laid on a needle of the pine in a row of two layers, seven in the lower layer, three in the upper one.

*Stage I.* Head round, brown black, clypeus pale; width about .35 mm. Body slender, normal white, with five smoky, brown-black, transverse bands on joints 5 to 9 and slight narrow ones on joints 2 to 4; feet pale. Very similar to *T. athasiaria*, but the color of the bands is not quite so dark and they are a little broader and connected by a narrow dark lateral line in that species.

*Stage II.* Head rounded, brown black, a little mottled with pale; width .55 mm. Body pale brown with longitudinal dark brown lines, distinct in a broad lateral band, leaving the dorsum broadly pale and the subventral fold distinctly so. Venter indistinctly lined. Tubercles i and ii slightly brown marked; feet all brown. A pale subdorsal

line is seen, edging the brown above. Rather slender, smooth.

*Stage III.* Head whitish brown, a brighter line on the face of each lobe, brown only narrowly in the sutures and on the posterior edge; width .8 mm. Body light sordid green, faintly, finely lined with pale, the subdorsal line most distinct. Dorsal space crossed by dorsal and addorsal lines, tubercles i and ii not contrasted. Lateral band double, consisting of a shade below the subdorsal line, a few dots, dark spiracles and a subventral line; venter obscurely lined and with dark medio-ventral patches. Feet pale; a heavy dark subdorsal spotting on thorax.

*Stage IV.* Head round, bilobed, whitish, dotted thickly with pale brown on the upper half and a few dark brown dots at eyes and apex of clypeus; width 1 mm. Body pale wood brown, almost whitish, finely longitudinally lined. Dorsal space with three pale brown, and four whitish lines; a subdorsal row of streaks with slight irregular marks below and dark spiracles; a narrow subventral line. Ventral lined like the dorsum, pale brown and whitish, and a medio-ventral series of large dark brown spots. Feet pale.

*Stage V.* (abnormal, interpolated) Head 1.2 mm. Coloration as in the next stage.

*Stage V.* (normal) Head rounded bilobed, full; pale greenish, the tubercles and sutures marked with brown; width 1.6 mm. Body smooth, uniform, pale green, a little whitish, subdorsal line obscure, whitish; dorsal space with faint pale brown linings, lateral region somewhat more distinctly so, appearing darker, and giving the dorsum a flattened look. Spiracles and tubercles iv dark. Venter faintly marked, like the dorsum, all the markings light. Feet pale.

*Stage VI.* (abnormal interpolated) Head 1.85 mm. Coloration as in the next.

*Stage VI.* (normal) Head whitish, blackish dotted, strongest in vertical suture, tubercles black; width 2.2 mm. Body pale yellowish green, approaching white, marked essentially as in *T. athasaria* and *T. fiscel-laria* and scarcely distinguishable from them. A distinct subdorsal line of the ground color; dorsal space faintly lined with brown, irregular and crinkly; tubercles dark. Sides, to below subventral fold, with similar lines, but black and distinct, especially a geminate lateral one; subventral fold pale; spiracles black. Venter pale with a pair of faint lines. Feet and the cervical shield orange tinted, except the anal feet.

*Food plant* yellow pine. Larvae from Brookhaven, Long Island, N. Y. Eggs June 17th, mature larvae in September, the winter doubtless passed as pupa. Single brooded. This larva differs from *T. athasaria* in food plant and manner of egg laying. The larva assumes the mature coloration at once in stage II, without any intervening pattern. The specimens before me grew very slowly and not vigorous, as shown by its having eight stages instead of the normal. It failed to pupate.

#### THE FIFTH SPECIES OF KERMES FROM MASSACHUSETTS.

*Kermes andrei* n. sp. ♀ scale pyriform in shape, very convex, 5 mm. high and 5 mm. in diameter at its base, variable in some individuals which are nearly hemispherical. Surface shiny. Color, light brown, with three and sometimes four, very dark brown bands, these variable in length and breadth. There are also several suffused dark brown blotchy spots and round dots, more numerous around the posterior cleft. Segmentation obscure; a median posterior keel-like prominence, which is very much wrinkled above near the

region of the posterior cleft. When boiled in K. H. O. the dermis is colorless. Rostral loop dark yellow, stout, not very long. No antenna of legs observed. The larvae which were formed in the body of the ♀, are yellow, elongate oval, 360 micromillimeters long, 160 broad. Antenna 6 segmented, 3 and 6 about equal and longest; 1 next, then 2 and 5 which are equal; 4 is the shortest. Formula (36) 1 (25) 4. Antennal segments—(1)20(2)16(3)24(4)12(5)16(6)24. Segments 4, 5 and 6 have a few short hairs. Legs short and stout. Femur with trochanter 76 long. Tibia with tarsus 68 long. Tarsal digitules long fine hairs with knobs: digitules of claw reaching a little beyond the claw. Caudal tubercles quite large, each bearing one long stout bristle (120 long), and three long stout spines (28 long). The marginal spines point backwards and about the same in length and breadth as those on



*Kermes andrei.*

the caudal tubercles. Rostral loop reaching beyond last pair of legs. Eggs oval 320 long, 240 broad.

*Hab.*—Lawrence, Mass., on white and red oaks, Sept. 9, 1899. Associated with *Kermes galliformis*, and found singly, not in clusters as in the latter. They are not common and the species seems to be viviparous.

I am pleased to name this coccid in honor of Mr. Ernest André of Gray, France, who has shown me many favors in the study of Formicidae. This species appears to be very distinct from all American *Kermes*. It looks rather like the European *K. gibbosus*, but is not the same. It is also different from the other European species. *K. fetti* Ehrh. is somewhat similar, but is evidently distinct, being smaller, redder, with spots instead of bands. Cockerell in litt. Nov. 18, 1899.

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